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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/730,926	12/10/2003	Jean-Marc Robert	ALC 3106	6727

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KRAMER & AMADO, P.C.
Suite 240
1725 Duke Street
Alexandria, VA 22314

EXAMINER	
YALEW, FIKREMARIAM A	
ART UNIT	**PAPER NUMBER**
2136	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/730,926	ROBERT, JEAN-MARC	
	Examiner	Art Unit	
	Fikremariam Yalew	2136	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 March 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 3-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 3-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. The office action is in replay to an amendment filed on 03/27/2007.Claim 2 is cancelled. Claims 1,3,13,14 have been amended. Claims 1,3-22 are pending.

2. The examiner withdraws the previous U.S.C 101,102 claim rejection based on the applicant amendment.

Response to Arguments

3. Applicant's arguments with respect to claims 1,3-22 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1,3,4-8,10-14,18-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Milliken (US Patent 6,978,223 B2) in view of Ebata et al (hereinafter referred as Ebata) US Pub No 20020042837.

6. As per claim 1: Milliken discloses a method of tracking-back a malicious data packet in a connection-oriented communication network, comprising the steps of: a) for

a given time window (Time Period), computing a unique flow identifier (FlowId) for each packet of a given flow seen by a router interface (Incoming Link) at a network node (See Fig 8 steps 805,505,510, 515 and col 3 lines 11-21); b) inserting said FlowId into a data structure associated to said Time Period and said Incoming Link, available at said network node (See Fig 8 steps 805,505,510,515); c) storing said data structure in a searchable repository(Fig 4 step 405 and col 6 lines 12-37); and d) repeating steps a) to c) for a next Time Period and for each Incoming link at said network node(See Fig 10).

Miliken does not disclose discloses determining the time of arrival X of said malicious packet at said network node and computing flowid for said malicious packet; and identifying said incoming link for said malicious packet by searching for the flowid of said malicious packet in all data structures for said network node that cover the time of arrival X.

However Ebata discloses determining the time of arrival X of said malicious packet at said network node and computing flowid for said malicious packet (0015,0049,0056); and identifying said incoming link for said malicious packet by searching for the flowid of said malicious packet in all data structures for said network node that cover the time(See 0015,0049,0056).

Therefore it would have been obvious to one ordinary skill in the art at the time the invention was made to modify the teaching method of Mikkiken to include e) determining the time of arrival X of said malicious packet at said network node and computing FlowId for said malicious packet; and f) identifying said Incoming Link for said malicious packet by searching for the FlowId of said malicious packet in all data

structures for said network node that cover the time of arrival X. This modification would have been motivated to do so, as suggested by, (See Milliken col 3 lines 8-10) inorder to determining network performance parameters based on the determined temporal behavior.

7. As per claim 3: the combination of Milliken and Ebata disclose further comprising tracing-back hop by hop the source of said single packet from said router, by performing steps e) and f) for each network node along the path of said malicious packet (See Ebata See 0015,0049,0056).

8. As per claim 4: the combination of Milliken and Ebata disclose the method wherein step a) is based on flow definition adopted for said network (See Milliken Fig 1 and col 4 lines 17-38).

9. As per claim 5: the combination of Milliken and Ebata disclose the method wherein step a) comprises applying a specified function to one or more header fields of each packet received in said flow (See Milliken Fig 5 steps 505,510,515).

10. As per claim 6: the combination of Milliken and Ebata disclose the method wherein step a) comprises applying a specified function to one or more header fields of each packet received in said flow and an incoming interface identification parameter (See Milliken Fig 10 step 1015 and Fig 8 step 805).

11. As per claim 7: the combination of Milliken and Ebata disclose the method wherein step a) comprises applying a specified function to one or more characteristics of each packet (See Milliken Fig 5 steps 505,510,515 and col 3 lines 11-20).

12. As per claim 8: the combination of Milliken and Ebata disclose the method wherein step a) comprises applying a specified function to one or more characteristics of each packet received in said flow and an incoming interface identification parameter (See Milliken Fig 5 steps 505,510,515 and col 3 lines 11-20).

13. As per claim 10: the combination of Milliken and Ebata disclose the method wherein said searchable repository is maintained for each router interface at said network node (See Milliken Fig 7 step 705 and col 3 lines 38-40).

14. As per claim 11: the combination of Milliken and Ebata disclose the method wherein said searchable repository stores all said data structures for all router interfaces at said network node (See Milliken Fig 10 steps 1010,1015).

15. As per claim 12: the combination of Milliken and Ebata disclose the method wherein said searchable database is a centralized searchable repository maintained for said network (See Milliken Fig 4 and col 6 lines 11-37).

16. As per claim 13: Milliken discloses a method of tracking-back a malicious data packet in a connection-oriented communication network, comprising the steps of: a) for a given time window (Time Period), computing a unique flow identifier (FlowId) for each packet of a given flow seen by a router interface (Incoming Link) at a network node based on a flow characterization parameter obtained from management system (See Fig 8 steps 805,505,510, 515 and col 3 lines 11-21); b) inserting said FlowId into a data structure associated to said Time Period and said Incoming Link, available at said network node (See Fig 8 steps 805,505,510,515); c) storing said data structure in a database that is centralized searchable repository(Fig 4 step 405 and col 6 lines 12-37);

and d) repeating steps a) to c) for a next Time Period and for each Incoming link at said network node(See Fig 10).

Milliken does not explicitly teach e)finding in said searchable repository the incoming link for said malicious packet based on a Flowid and a time of arrival X of said malicious packet.

However Ebata disclose e) finding in said searchable repository the incoming link for said malicious packet based on a Flowid and a time of arrival X of said malicious packet (See 0015,0049).

Therefore it would have been obvious to one ordinary skill in the art at the time the invention was made to modify the teaching method of Mikkiken to include finding in said searchable repository the incoming link for said malicious packet based on a Flowid and a time of arrival X of said malicious packet. This modification would have been motivated to do so, as suggested by, (See Milliken col 3 lines 8-10) inorder to determining network performance parameters based on the determined temporal behavior.

17. As per claim 14: Milliken disclose a system for tracking-back a malicious data packet in a connection-oriented communication, comprising: means for computing a unique flow identifier FlowId for each packet of a flow seen by a router interface (Incoming Link) at a network node over a given period of time (Time Period); means for inserting said FlowId into a data structure associated to said Time Period (See Fig 8 steps 805,505,510, 515), and said Incoming Link available for said network node; a

database that is a centralized searchable repository for storing said data structure(Fig 4 step 405 and col 6 lines 12-37).

Mikkiken does not explicitly teach a search engine for finding in said searchable repository the Incoming Link for said malicious packet based on a FlowId and a time of arrival X of said malicious packet.

However Ebata discloses a search engine for finding in said searchable repository the Incoming Link for said malicious packet based on a FlowId and a time of arrival X of said malicious packet (See 0015,0049,0056).

Therefore It would have been obvious to one ordinary skill in the art at the time the invention was made to modify the teaching method of Mikkiken to include a search engine for finding in said searchable repository the Incoming Link for said malicious packet based on a FlowId and a time of arrival X of said malicious packet. This modification would have been motivated to do so inorder to enhance the security of the system.

18. As per claim 16: the combination of Milliken and Ebata teach the system wherein one said searchable repository is maintained for each interface at said network node (See Milliken Fig 7 step 705 and col 3 lines 38-40).

19. As per claim 17: the combination of Milliken and Ebata teach the system of wherein one said searchable repository is maintained for said network node (See Milliken Fig 4 and col 6 lines 11-37).

20. As per claim 18: the combination of Milliken and Ebata teach the system of wherein said searchable repository is a centralized database maintained for said network (See Milliken Fig 4 and col 6 lines 11-37).

21. As per claim 19: the combination of Milliken and Ebata teach the system of further comprising a flow based monitoring system for providing a flow characterization parameter to said means for calculating (See Milliken Fig 12 step 1210).

22. As per claim 20: the combination of Milliken and Ebata teach the system further comprising a flow management system for generating a flow characterization parameter (See Milliken Fig 9 step 915).

23. As per claim 21: the combination of Milliken and Ebata teach the system of wherein said means for computing is a FlowId calculator for computing said FlowId form one or more of packet header fields, packet characterization parameters and interface identification information (See Milliken Fig 12 steps 1230,1235).

24. As per claim 22: the combination of Milliken and Ebata teach the system wherein said means for computing is a FlowId calculator for computing said FlowId form packet header information (See Milliken Fig 12 step 1205).

25. **Claims 9,15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Milliken (US Patent 6,978,223 B2) in view of Ebata et al (hereinafter referred as Ebata) US Pub No 20020042837 and further in view of Snoeren et al(Hash based IP Traceback, 27 Augest 2001).**

26. As per claim 9: the combination of Milliken and Ebata teach claim 1 as recited above. Milliken and Ebata do not explicitly teach the method wherein said data structure is a hash table based on a Bloom filter. However Snoeren teach the combination of Milliken and Snoeren the method wherein said data structure is a hash table based on a Bloom filter (See page 2 first paragraph).

Therefore It would have been obvious to one ordinary skill in the art at the time the invention was made to modify the teaching method of Milliken to include the method wherein said data structure is a hash table based on a Bloom filter. This modification would have been motivated to do so, as suggested by, (Snoeren page 2) inorder to reduce the memory requirement through the use of Bloom filter.

27. As per claim 15: the combination of Milliken and Ebata teach claim 14 as recited above. The combination of Milliken and Ebata does not explicitly teach the system further comprising a flow-based monitoring system for tracking back hop-by-hop the source of said malicious packet. However Snoeren teach a flow-based monitoring system for tracking back hop-by-hop the source of said malicious packet (See Snoeren page 4 section 3.3). Therefore It would have been obvious to one ordinary skill in the art at the time the invention was made to modify the teaching method of Milliken and Ebata to include a flow-based monitoring system for tracking back hop-by-hop the source of said malicious packet. This modification would have been motivated to do so inorder to enhance the security of the system.

Conclusion

28. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

29. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fikremariam Yalew whose telephone number is 5712723852. The examiner can normally be reached on 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Moazzami Nasser can be reached on 5712724195. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Fikremariam Yalew
05/30/2007
FA

Art Unit 2136

NASSER MOAZZAMI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

6/1/07